Seasonal changes in water beetle assemblages in a temporary pond of Lonjsko polje nature Park

Martina Temunović 1,2,Lucija Šerić Jelaska 3

1Faculty of Forestry, University of Zagreb, Svetosimunskas 25, 10 000 Zagreb, Croatia
2Association for Biological Research - BIOM, Sestinski dol 12, 10 000 Zagreb, Croatia; martina.temunovic@biom.hr
3Group for Systematic Zoology and Entomology, Department of Biology, Faculty of Science, Rooseveltov trg 6, 10 000 Zagreb, Croatia; slucija@zg.biol.pmf.hr

Introduction

Water beetles (Coleoptera, Insecta) constitute one of the main groups of aquatic macroinvertebrates in temporary and permanent standing waters which represent the most important habitats for this group of insects. Lonjsko polje is one of the most naturally flooded plains in Europe with a variety of aquatic habitats, included in Ramsar List of Wetlands of International Importance. The main objective of this study was to determine in details the seasonal dynamics of water beetles in a single semipermanent pond of the area of Lonjsko polje Nature Park (Figure 1) over one year period.

Furthermore, we wanted to investigate the relation between the changes in assemblage composition with respect to fluctuations of pond dimensions and physico-chemical properties of the pond and finally to test if the microhabitats within the pond (deepwater vs. shoreline) significantly differ.

Materials and Methods

Field survey was conducted from May to December 2004, in an open temporary pond “Trebeč” situated near the forest edge (Figure 2).

Aquatic coleoptera were collected using semiquantitative method of sweeping D-frame pond net. Sampling was performed through the entire water column for deepwater samples and close to the shore through the vegetation against the banks for shoreline samples.

Water temperature, dissolved oxygen concentration, pH and conductivity were measured at each sampling date, along with pond dimensions (length, width and max. depth).

Fluctuations of water beetle fauna during the season has been recorded in relation with measured physical-chemical parameters using Pearson’s Correlation Coefficient in Excel. Differences between the two pond microhabitats were tested with standard t-test.

Results

Altogether, 1458 specimens belonging to 10 families of water beetles were collected (Table 1). Seasonal dynamics of eudominate water beetle families is presented in Figure 3. Although abundance of individual families vary strongly, the overall number of water beetles in the pond is more or less constant through the season (Table 1). The pond was dried out during August and September.

Among 289 Hydradephagan specimens, 22 species were identified (Table 3). Seasonal fluctuation of six most abundant species is presented in Figure 4, showing that most species reach the peak of their abundance in June.

Results show a significant positive correlation of Hydradephagan abundance and species richness with pond dimensions (Figure 6) and negative correlation with conductivity and dissolved CaCO3 in water (Table 2), as previously demonstrated by some authors. We found no significant correlations between Polyphagan water beetle fauna and examined parameters.

T-test showed that Hydradephagan abundance is significantly different in the two microhabitat types (p = 0.0097), being significantly higher at the shoreline (Figure 5) as proposed in literature.

References